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EXAMINER	
PRICE, CARL D	

ART UNIT	PAPER NUMBER
3749	

MAIL DATE	DELIVERY MODE
03/16/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/580,138	DANERI ET AL.	
	Examiner	Art Unit	
	Carl D. Price	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/19/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. Note, for example, the following:

- In **claim 1**, no structure is provided which correlate either one of the "single duct" and "refractory unit" with any other element(s) recited in the claim, in such a manner as to present a complete operative device. Also, it is unclear how, or with the use of what means, the mere operation of the combustible gas regulating system by itself necessarily results in a "flame functioning mode" and a "flameless functioning mode". And, it is unclear which of the claimed elements might be associated with the formation of a "flame functioning mode" and a "flameless functioning mode". That is, it is unclear what recited structure is necessarily associated with determining or forming the respective "flame functioning mode" and "flameless functioning mode".

- **Claim 2** is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:

- In claim 2, it is unclear how the only broadly claimed "series of calibrated holes" of the "first region" and/or the "free annular crown" might necessarily allow "the passage of a sufficient quantity of air suitable for preventing the overheating of the inner lance (11)", as the claim lacks sufficient structure of the "free annular crown" itself as well as any structural cooperative relationships between the "free annular crown" and the "inner lance". It is also unclear what, if any, relationship there might be between the "pre-heated air" of claim 1 and the "air" of claim 2. That is, it is unclear if the "air" (claim 2) originates from a source is the same as or differs from the previously recited "pre-heated air".

The term "low" (i.e. - "low emissions of polluting agents") in **claim 1** is a relative term which renders the claim indefinite. The term "low" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 1 recites the limitation(s) "the latter" and "the adduction". There is insufficient antecedent basis for these limitations in the claim.

The term "low" (i.e. – "low emissions") in the penultimate line of **claim 1** is a relative term which renders the claim indefinite. The term "low" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The term "calibrated" in **claims 4, 5, 7, 11, 12** and **13** is a relative term which renders the claim indefinite. The term "calibrated" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Regarding **claim 1**, where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir.1999). For

the purpose of examination, the term "**adduction**" in **claims 1-29** is understood to mean, for example, "convey", "conduct", "introducing", or "transport", while the accepted meaning is "allegation". The term causes the claim to be indefinite because the specification does not clearly redefine the term.

Claim 2 recites the limitation(s) "the latter". There is insufficient antecedent basis for these limitations in the claim.

Claim 9 recites the limitation(s) "said at least two outer side lances". There is insufficient antecedent basis for these limitations in the claim.

Claims 23 and **25** recite the limitation(s) "it". There is insufficient antecedent basis for these limitations in the claim.

The above noted informalities are merely representative of informalities present in the claims. Applicant should therefore review all of the claims for further and similar informalities.

Claims

The claims include reference characters which are enclosed within parentheses.

Applicant is reminded that the use of reference characters is to be considered as having no effect on the scope of the claims. See MPEP § 608.01(m).

laim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims Rejected under 35 U.S.C. 102(b)

Claims 1-3, 5, 7, 8 and **10** are rejected under 35 U.S.C. 102(b) as being anticipated by **US 3418062 (Hovis et al)**.

US 3418062 (Hovis et al) shows and discloses a gas burner (11 or 124; figures 8-11) comprising:

- a main metal body (68');

- an inner lance (92' or 90') for combustible gas;

- at least two outer lances (116, 116') for combustible gas;

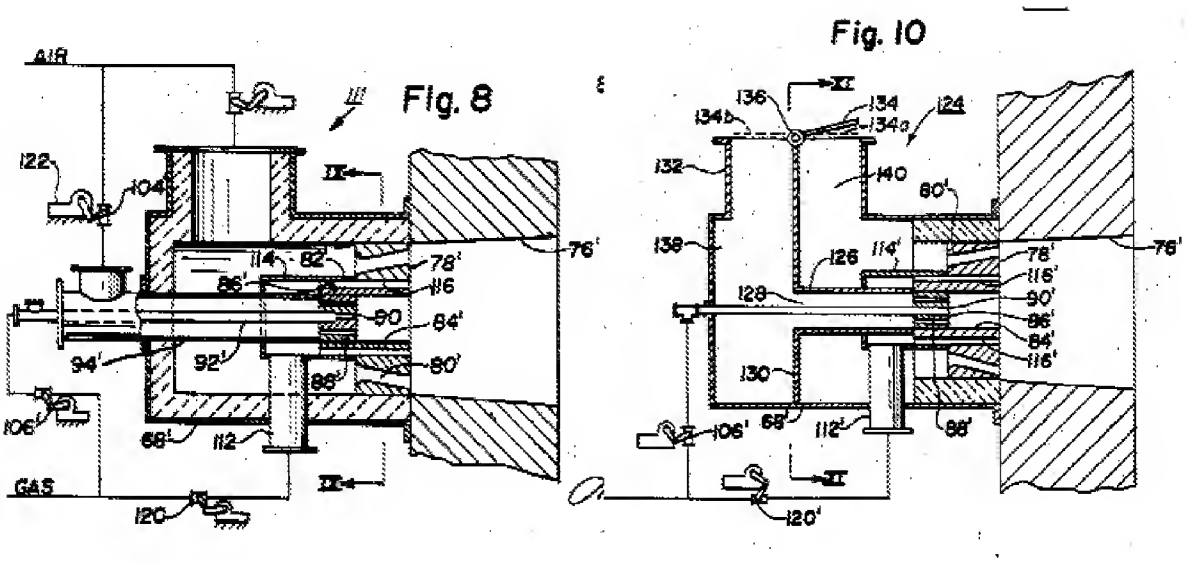
- a single duct (not shown; e.g.- , connected to air inlet 132) for the introducing pre-heated air;

a regulation system for the combustible gas (106', 120');

a refractory unit (at 78', 86'),

characterized in that said gas burner (11 or 124) comprises:

- a series of nozzles (80') for the injection of the pre-heated air into the combustion chamber, and in that, by operating on the gas regulation system, it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode, the latter characterized by low emissions of polluting agents.



Further regarding the above claims being rejected under 35 U.S.C. 102(b) as being anticipated by **US 3418062 (Hovis et al)**, recitations such as "for combustible gas", "for the introducing pre-heated air", "the injection of the pre-heated air" and "it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode, the latter characterized by low emissions of polluting agents", are deemed to be recitations of intended use which do not result in a structural difference between the claimed invention and the prior art and therefore fail to patentably distinguish the claimed invention from the prior art. Applicant is reminded that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In **US 3418062 (Hovis et al)** the inner lance (92' or 90') and the at least two outer lances (116) are convey a combustible gas. Since, in **US 3418062 (Hovis et al)**, the single duct (not shown; e.g.- necessarily connected to air inlet 132 as represented by the conduit referenced as "air") conveys air it is therefore likewise capable of conveying pre-heated air, there being no pre-heated air means, or source, recited in the claim. Additionally, since the only broadly recited structure which goes to make up the claimed invention does not differ from that shown and disclosed in **US 3418062 (Hovis et al)**, the prior art burner would necessarily be capable of performing the function recited of "continuously switch from a flame functioning mode of the burner to a flameless functioning mode, the latter

characterized by low emissions of polluting agents". That is, the recitation of "continuously switch from a flame functioning mode of the burner to a flameless functioning mode, the latter characterized by low emissions of polluting agents" is a method or process limitation which fails to impart any positive recitation(s) of structure to the apparatus claims.

In regard to the at least two outer lances recited in **claim 1**, the **US 3418062 (Hovis et al)** passages (116, 116') for combustible gas are deemed to be the structural and functional equivalent to applicants only broadly claimed at least two outer lances. That is, since the claims lack any particular structure of the lances that would necessarily distinguish them from the passages in **US 3418062 (Hovis et al).**

In regard to **claim 2, US 3418062 (Hovis et al)** shows (see the annotated figures herein below) and discloses a first region, a second region, a third region, which are concentric, said first region in turn comprising a series of calibrated holes (88') and preferably a free annular crown (86'), the latter for allowing the passage of a sufficient quantity of air (88') suitable for preventing the overheating of the inner lance (92, 90; 90').

In regard to **claim 3, US 3418062 (Hovis et al)** shows (see the annotated figures herein below) nozzles (88, 88') for the air is housed in the second region.

In regard to **claim 5, US 3418062 (Hovis et al)** shows the first region comprising a cavity (84') communicating with the combustion chamber (76') and into which the air from the series of calibrated holes (88') flows together with the combustible gas injected through the inner lance.

In regard to **claims 7, 8** and **10, US 3418062 (Hovis et al)** shows the nozzles of said series of nozzles situated at an equal distance along a coaxial circumference with the inner lance (90', 92') and lying on a base surface of the second region (see the annotated figures herein below).

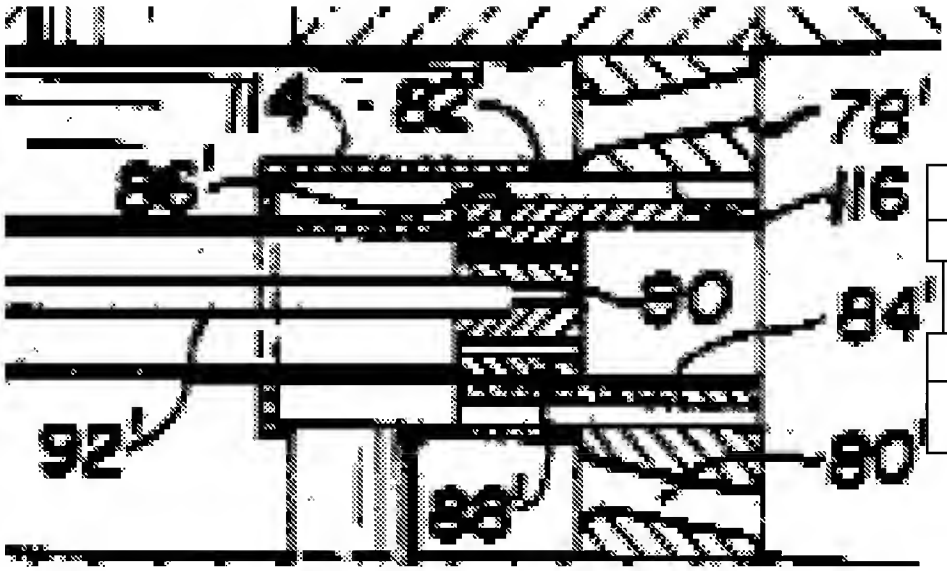
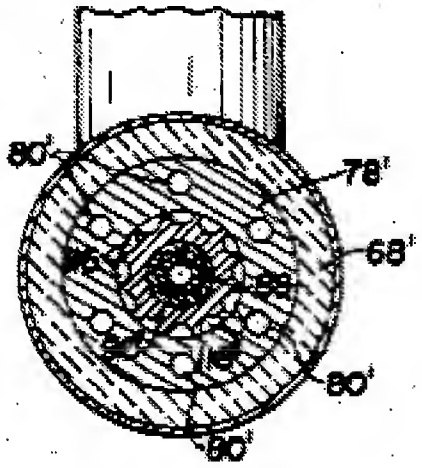


Fig. 9



Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims Rejected under 35 U.S.C. 102(b)

Claims 1-3, 5, 7, 8 and **10** are rejected under 35 U.S.C. 102(b) as being anticipated by **US 3418062 (Hovis et al)** in view of **US 3958413 (Cornelius et al)** or **US 5570679 (Wunning).**

US 3418062 (Hovis et al) shows and discloses a gas burner (11 or 124; figures 8-11) comprising:

- a main metal body (68');

- an inner lance (92' or 90') for combustible gas;

- at least two outer lances (116, 116') for combustible gas;

- a single duct (not shown; e.g.- , connected to air inlet 132) for the introducing pre-heated air;

- a regulation system for the combustible gas (106', 120');

- a refractory unit (at 78', 86');

characterized in that said gas burner (11 or 124) comprises:a series of nozzles (80') for the injection of the pre-heated air into the combustion chamber, and in that, by operating on the gas regulation system, it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode, the latter characterized by low emissions of polluting agents.

US 3418062 (Hovis et al) shows and discloses the invention substantially as set forth in the claims with possible exception to:

- means introducing pre-heated air;

- wherein when operating on the gas regulation system, it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode, the latter characterized by low emissions of polluting agents.

US 3958413 (Cornelius et al) teaches, from applicant's same multi-mode flame and flameless burner field of endeavor, means introducing pre-heated air and wherein when operating on the gas regulation system, it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode (i. e. - "invisible burning"), the latter characterized by low emissions of polluting agents.

US 3958413 (Cornelius et al) shows:

U.S. Patent May 25, 1976 Sheet 1 of 2 3,958,413

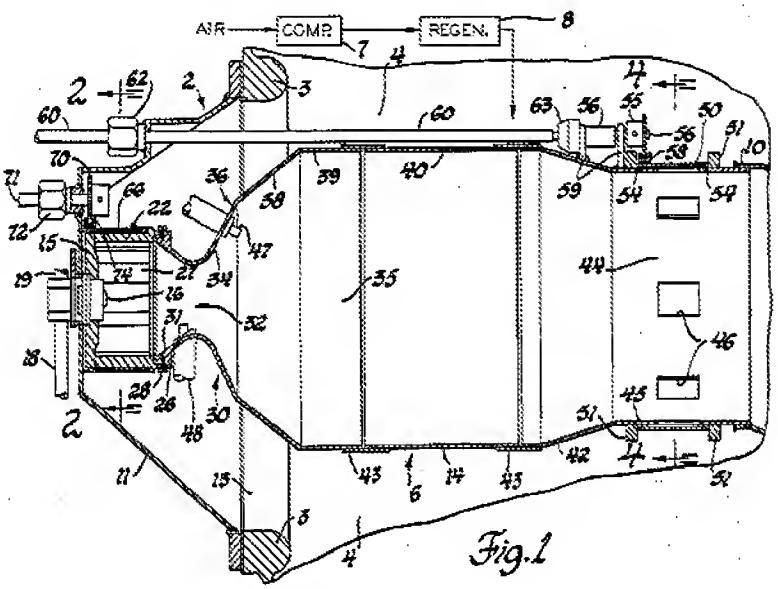


Fig. 1

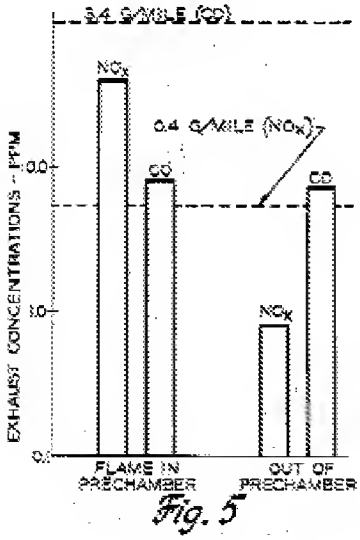


Fig. 5

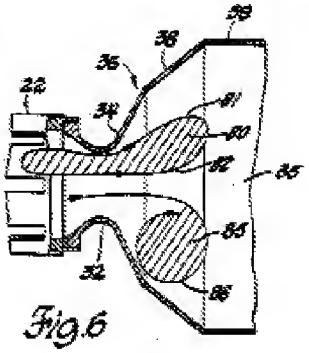


Fig. 6

US 3958413 (Cornelius et al) discloses:

(1) Referring first to FIG. 1, the combustion apparatus 2 illustrated is a part of a small gas turbine engine such as might be used for propulsion of automobiles. Since the invention can be understood without reference to details of the engine, these are omitted. The engine in which the combustion apparatus is used is preferably a regenerative engine; that is, one in which the **compressed air flowing to the combustion apparatus is heated by heat exchange** with gases exhausting from the turbine of the engine. A regenerative engine is favorable to the practice of our method of combustion, since it involves vaporization of the fuel prior to combustion which may most readily be accomplished with relatively hot air entering the combustor. In a regenerative engine, the air entering the combustor may be of the order of 900.degree.F. or more during the normal engine operating regime. (Highlighting and Underlining Added)

(31) With **hot air** supplied to the combustion apparatus through a regenerator, recirculation is not needed to secure vaporization of the droplets of fuel sprayed by the nozzle 16. During light-off, particularly with a cold engine, the air is relatively cool, being heated to some extent by compression, but it is not sufficiently warm to achieve good vaporization of the fuel. This is promoted by recirculation of flame or combustion products during the swirling start-up operation. (Highlighting and Underlining Added)

(23) **When the flame** has been established and is **fully expelled from the prechamber,** there is substantially **invisible burning** in the **reaction chamber recirculation zone 85** of the previously formed mixture of vaporized fuel and air. This is attended by extremely low emissions of carbon monoxide and nitrogen oxides, as well as unburned hydrocarbons and smoke, which are much less a problem than are carbon monoxide and nitrogen oxides. (Highlighting and Underlining Added)

(24) **FIG. 5 illustrates the magnitude of the reduction in the emissions of nitrogen oxides** that can be obtained when the flame is forced out of the prechamber while using the combustion apparatus shown in FIGS. 1 through 4 and operated as described above. Note that the vertical scale is a logarithmic scale of nitrogen oxide and carbon monoxide concentrations in parts per million. Concentration data are shown for a typical stabilized combustor operating condition where the flame is either in or out of the prechamber. The broken line identified as 3.4 g/mile (CO) represents the maximum allowable carbon monoxide content, assuming a vehicle fuel consumption of ten miles per gallon. The broken line identified as 0.4 g/mile (NO.sub.x) represents the allowable production of nitrogen oxides, assuming the same fuel consumption. (Highlighting and Underlining Added)

(26) The fl**ame may be kept out of the prechamber** and stabilized in the reaction chamber for various rates of fuel and air flow **by suitable modulation of the primary**

and secondary air entrance areas. These may be coupled to an **automatic control which has been calibrated in terms of the characteristics of the particular combustion apparatus** discharging through the particular turbine nozzle or other structure. The opening of the primary or secondary ports may be controlled as a function of air pressure, fuel pressure, engine power level setting or other parameter related to the level of engine operation and air flow. (Highlighting and Underlining Added)

US 5570679 (Wunning) teaches, from applicant's same multi-mode flame and flameless burner field of endeavor, teaches, from applicant's same multi-mode flame and flameless burner field of endeavor, means introducing pre-heated air (15) and wherein when operating on the gas regulation system (22, 23, 30), it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode (i. e. - "an essentially flame-- and pulsation-free reaction"), the latter characterized by low emissions of polluting agents.

US 5570679 (Wunning) shows:

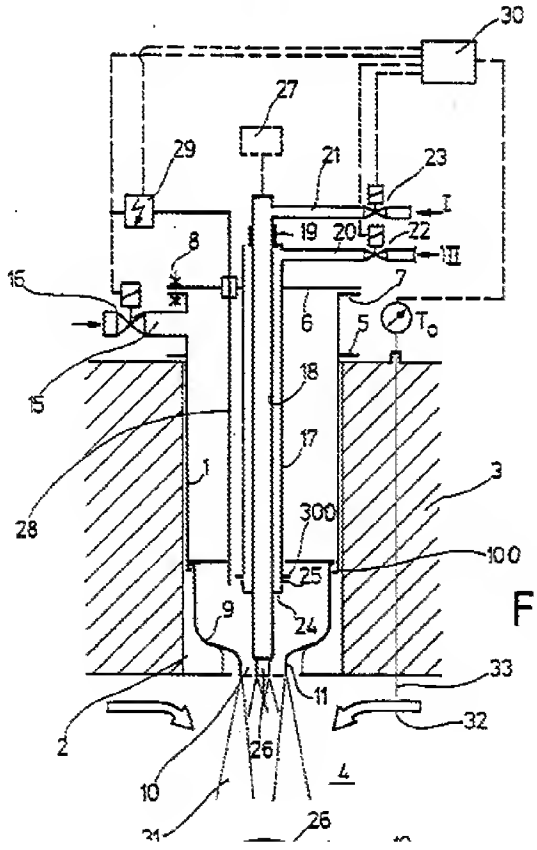


Fig. 1

US 5570679 (Wunning) discloses:

(18) A further **lowering of NOx emissions** is enabled, conversely, by a more recent impulse burner (U.S. Pat. No. 5,154,599, claiming the priority of European Patent 0 463 218), in which **once the ignition temperature in the heating chamber is reached,** the combustion air is **switched over** entirely to an external nozzle ring, and consequently no further combustion occurs in the combustion chamber. For **a specified nozzle geometry**, extremely low NO.sub.x values can then be attained (below 10 ppm). **With externally preheated air**, however, two hot air valves are needed in this burner, while in the version as a recuperator and regenerator burner, the combustion air, in the heating-up mode, does not flow via the heat exchangers. (Highlighting and Underlining Added)
(33) The industrial burner can also be designed as a recuperator burner, where an integrated recuperator, through which the combustion air and combustion exhaust gases flow in countercurrent, is assigned to the combustion chamber. It is also possible to operate the burner with an external recuperator if needed, or with external air preheating. (Highlighting and Underlining Added)
(4) A **lateral air supply stub 15** is connected to the jacket tube 1 outside the furnace wall 3; a combustion air valve 16 is located in this stub 15, and **optionally preheated combustion air** can be supplied by way of the stub 15. The combustion air supply stub 15, together with the jacket tube 1 and the combustion air valve 16, forms the air supply device, which as seen from the drawing is shaped such that all the combustion air supplied acts upon the combustion chamber 9 and emerges from the outlet opening 10 thereof. (Highlighting and Underlining Added)

(15) As soon as the **furnace chamber 4 has been heated to the ignition temperature of the fuel** assigned to the outer fuel lance 17, which is ascertained by a temperature sensor 33 protruding into the furnace chamber 4, **the control unit 30 switches the burner over to a second operating state;** to do so, it closes the first fuel valve 22 and opens the second fuel valve 23. **This switchover may be done in stages or continuously.** (Highlighting and Underlining Added)

(16) In this **second operating state**, no further fuel is introduced into the combustion chamber via the radial nozzles 25, and as a consequence the combustion process in the combustion chamber 9 is essentially suppressed entirely. At the same time, fuel is now fed into the furnace chamber exclusively through the axial second fuel nozzle 26 that discharges into the furnace chamber 4 in the vicinity of the mouth of the outlet opening 10. Because of the injector action of the combustion air jet or stream outflowing at unreduced impetus from the outlet opening 10, **a mixture of combustion exhaust gas and air into which the fuel is introduced forms in the furnace chamber 4 in the vicinity of the mouth of the outlet opening 10.** Since the **furnace chamber 4 has heated up to the ignition temperature** of the fuel, the reaction of the fuel with the

combustion air now takes place in a developing reaction zone in the furnace chamber 4 that is located outside the combustion chamber 9. (Highlighting and Underlining Added)

(17) In this reaction zone, depending on the reaction conditions established, the reaction of the fuel with the combustion air can take place with flame development, but **an essentially flame and pulsation-free reaction can also be established**. (Highlighting and Underlining Added)

(18) **NO.sub.x emissions** in the **first operating state**, that is, the startup state, are already relatively slight; in any case, they are within the legally stated limits. In the **second operating state,** which is the normal operating state, **NOx emissions are further lowered by from one to two orders of magnitude compared with conditions in the first operating state.** Depending on the heating chamber temperature, they can even be lowered to the range below 1 ppm. (Highlighting and Underlining Added)

In regard to **claims 1-3, 5, 7, 8** and **10,** for the purpose of lowering the NOx emissions of the second mode or state of operation by from one to two orders of magnitude compared with conditions in the first operating mode or state, it would have been obvious to a person having ordinary skill in the art to modify the air supply of **US 3418062 (Hovis et al)** to be that of pre-heated air and to further modify the burner components such that when operating on the gas regulation system between the first mode and the second mode, it is possible to continuously switch from a flame functioning mode of the burner to a flameless functioning mode (i.e. - invisible, flame-free, etc.), in view of the teaching of **US 3958413 (Cornelius et al)** or **US 5570679 (Wunning).**.

Claims Rejected under 35 U.S.C. 103(a)

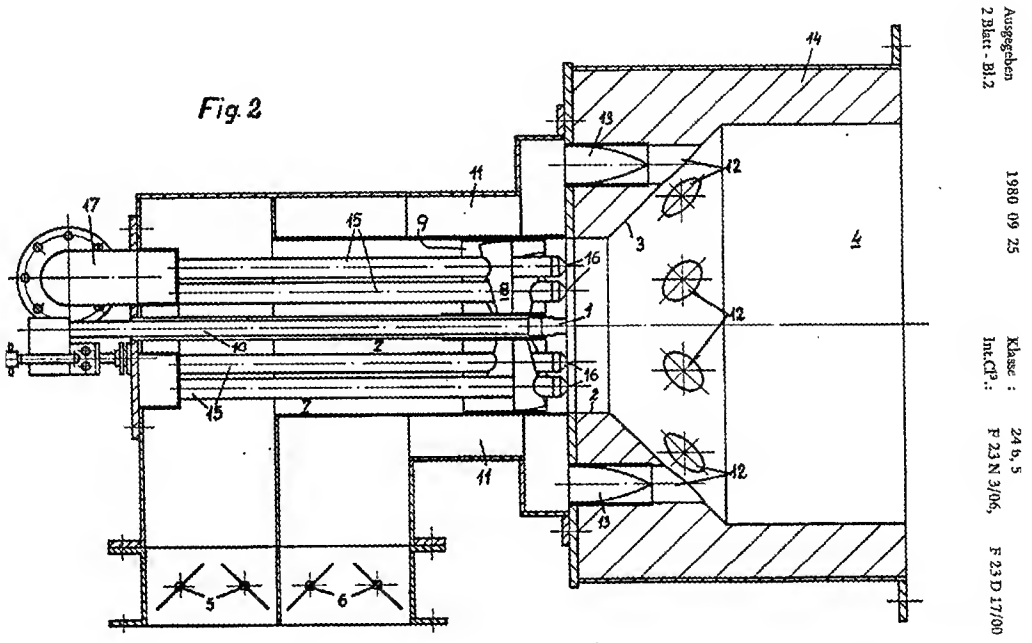
Claims **4, 10-21** and **26-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over **US 3418062 (Hovis et al)** alone, or **US 3418062 (Hovis et al)** in view of **US 3958413 (Cornelius et al)** or **US 5570679 (Wunning),** as applied to claims **1-3, 5, 7, 8** and **10** above, and further in view of **AT 358702** (of record).

US 3418062 (Hovis et al) shows and discloses the invention substantially as set forth in the claims with possible exception to;

- the first flame producing region of with a flame detector and ignition device:

- the various design relationships, dimensions and ratios set forth in applicants' claims;
- means to protect the lances therein;
- inner refractory insulation material; and
- a perforated flange.

AT 358702 teaches, from applicant's same burner field of endeavor, a burner including at least two pass-through holes (12) for housing at least two outer side lances (13) as a means for communicating and directing a fluid to the combustion chamber.



In regard to **claim 6,** Official Notice is taken that flame detectors and ignition devices are known to be necessarily placed in the region of flame formation of burners. Therefore, in view of that which is well known it would have been obvious to a person having ordinary skill in the art to provide the first flame producing region of **US 3418062 (Hovis et al)** with a flame detector and ignition device (see for example: US 3224487, US 4643672).

In regard to **claims 7, 8** and **10, US 3418062 (Hovis et al)** shows the base surface of the second region and the base surface of the third region of the refractory unit being coaxially aligned with an internal wall (70) of the oven.

In regard to **claims 4, 10-21** and **26-28**, since selection of the relative dimensions the various elements which go to make up a given burner design would necessarily depend on numerous interrelated design concerns such as, the overall size and shape of the burner, the type of fuel gas combusted, any desired flame shape and size, the size and shape of the combustion chamber, characteristic of any material being heated within the combustion or work chamber, etc., to configure a burner such as **US 3418062 (Hovis et al)** according to the design relationships, dimensions and ratios set forth in applicants' claims can be viewed as nothing more than merely a mater of choice in design absent the showing of any new or unexpected results produced therefrom over the prior art of record. Furthermore, in regard to **claims 4, 5, 7, 11, 12** and **13**, the term calibrated can only be given the meaning of "selected", since the term "calibrated" is not defined by the claim. Therefore, since the passages of **US 3418062 (Hovis et al)** would necessarily have been selected, they are therefore understood to be the structural and functional equivalent to applicants' only broadly claimed "calibrated holes".

In regard to **claims 9, 23** and **24** for the purpose of providing suitable alternative means for communicating and directing a supply of fuel gas to the combustion chamber, it would have been obvious to a person having ordinary skill in the art to form the at least two outer side passages (116') **US 3418062 (Hovis et al)** as at least two pass-through holes for housing at least two outer side lances, in view of the teaching of **AT 358702.** In regard to claims 23 and 24, in particular, the passages, or holes, (12) which encompass the lances (13) of **AT 358702** each necessarily act to protect the lance therein. As such, when modified to include at least two pass-through holes for housing at least two outer side lances as taught by **AT 358702**, the portion of the metal body supported refractory hole (12) surrounding the lance would act to protect the lance therein, at least in the manner only broadly set forth in applicants' claims.

In regard to **claim 22**, Official Notice is taken that it is well known in the art of burners to apply fiber insulation material as a refractory material in metal burners. Therefore, in view of

that which is known and for the known purpose, it would have been obvious to a person having ordinary skill in the art to form the inner refractory insulation material of **US 3418062 (Hovis et al)** of a fiber material.

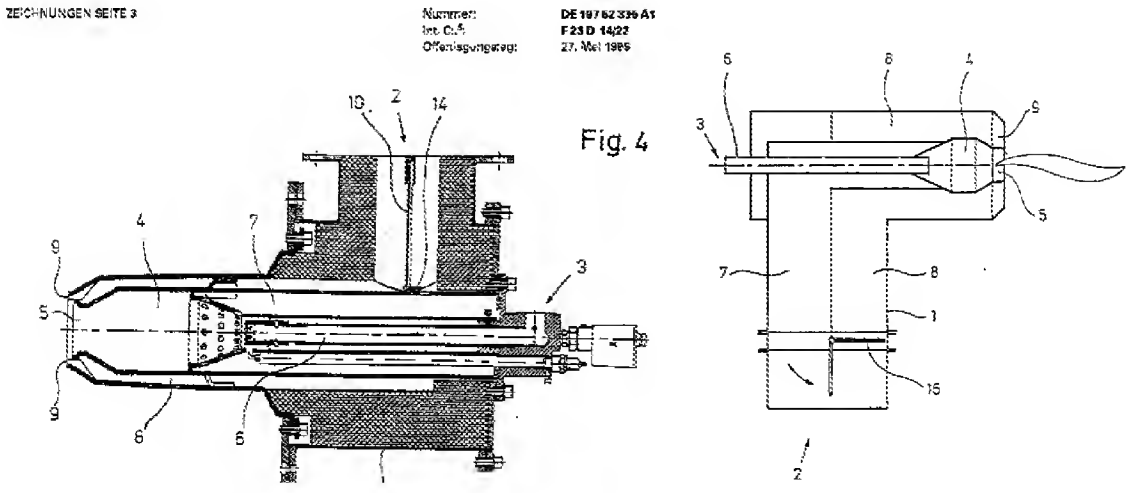
In regard to **claim 25, US 3418062 (Hovis et al)** shows the entirety of the burner housing being on the wall of a furnace (72) by a flange (not referenced). As such, the component elements such as the lances (116') within the burner are therefore supported by the burner flange. In addition, with regard to the flange, Official Notice is taken that burner flanges are known to have perforations for receiving mounting bolts. While knot shown in **US 3418062 (Hovis et al)**, it would have been obvious to a person having ordinary skill in the art to provide the flange of **US 3418062 (Hovis et al)** with bolt holes or perforations, in view of that which is known in the art of burner installation.

Conclusion

See the attached USPTO for, 892 for prior art made of record and not relied upon which is considered pertinent to applicant's disclosure.

See **DE 19752335 A1** which discloses air-inlet (2) for pre-heatable combustion air:

Fig. 11



ABSTRACT:

CHG DATE=19990902 STATUS=N>A housing (1) has a combustion chamber (4) with nozzle outlet (5) and air-inlet (2) for **pre-heatable combustion air,** and a gas-inlet (3). A gas lance (6) attached to the gas-inlet leads to the combustion chamber. A primary air guide (7) connected to the air-inlet leads to the combustion chamber. A secondary air guide (8) enclosing the combustion chamber and connected to the air-inlet opens out into a ring of radiation nozzles (9) on a level with the nozzle-outlet. An adjustable distributor distributes the pre-heatable combustion air to the primary and secondary air guides. A control is attached to the drive for the distributor and to at least one sensor for detecting stove/furnace temperature and or combustion air temperature.

USPTO CUSTOMER CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carl D. Price whose telephone number is (571) 272-4880. The examiner can normally be reached on Monday through Friday between 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B. McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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